PB89-172753

EPA (Environmental Protection Agency)
Pesticide Fact Sheet No. 192: Mecoprop (MCPP)

(U.S.) Environmental Protection Agency
Washington, DC

Dec 88

U.S. Department of Commerce
National Technical Information Service
NTIS

50272-101

| REPORT DOCUMENTATION PAGE | 1. REPORT NO. | 2. | 3. Recipient's Accession No. PB89-172753 |
|---|---|---|---|
| 4. Title and Subtitle: EPA Pesticide Fact Sheets - Mecoprop (MCPP) No. 192 | | | 5. Report Date: December 1988 |
| 7. Author(s): EPA, Office of Pesticide Programs, Registration Division | | | 8. Performing Organization Rept. No. 540/FS -89-031 |
| 9. Performing Organization Name and Address: U.S. Environmental Protection Agency, Office of Pesticide Programs, Registration Division (TS-767C), 401 M Street, SW, Washington, D.C. 20460 | | | 10. Project/Task/Work Unit No.; 11. Contract(C) or Grant(G) No. (C) (G) |
| 12. Sponsoring Organization Name and Address: Same as #9 | | | 13. Type of Report & Period Covered; 14. |

15. Supplementary Notes

16. Abstract (Limit: 200 words)

This document contains up-to-date chemical information, including a summary of the Agency's regulatory position and rationale, on a specific pesticide or group of pesticides. A Fact Sheet is issued after one of the the following actions has occurred.

1. Issuance or reissuance of a registration standard,
2. Issuance of each special review document,
3. Registration of a significantly changed use pattern,
4. Registration of a new chemical, or
5. An immediate need for information to resolve controversial issues relating to a specific chemical or use pattern.

17. Document Analysis a. Descriptors

Pesticides, regulations, Chemical Information Fact Sheet, Use Patterns, science findings.

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group

| 18. Availability Statement: Publicly Available | 19. Security Class (This Report) Unclassified | 21. No. of Pages 13 |
|---|---|---|
| | 20. Security Class (This Page) Unclassified | 22. Price MF A03 13.95/76.95 |

(See ANSI-Z39.18)

OPTIONAL FORM 272 (4-77)
(Formerly NTIS-35)
Department of Commerce

REPRODUCED BY
U.S. DEPARTMENT OF COMMERCE
NATIONAL TECHNICAL INFORMATION SERVICE
SPRINGFIELD, VA. 22161

United States
Environmental Protection
Agency

Office of Pesticides and Toxic Substances
Office of Pesticide Programs (TS-767C)
Washington, DC 20460

540/FS-89-031

EPA

# Pesticide Fact Sheet

**Name of Chemical:** 2-(2-Methyl-4-chlorophenoxy)propionic acid and its salts and esters

**Reason for Issuance:** Registration Standard

**Date Issued:** December 1988

**Fact Sheet Number:** 192

## DESCRIPTION OF CHEMICAL

| | |
|---|---|
| Chemical Names: | 2-(2-Methyl-4-chlorophenoxy)propionic acid;<br>potassium 2-(2-methyl-4-chlorophenoxy)-propionate;<br>diethanolamine 2-(2-methyl-4-chlorophenoxy)-propionate;<br>dimethylamine 2-(2-methyl-4-chlorophenoxy)-propionate;<br>isooctyl 2-(2-methyl-4-chlorophenoxy)-propionate |
| ANSI Common Names: | MCPP (includes MCPP acid as well as the MCPP potassium salt; MCPP diethanolamine salt; MCPP dimethylamine salt; and MCPP isooctyl ester) |

| | |
|---|---|
| Other Common Names: | Mecoprop |
| Principal Trade Names: | MCPP and Mecoprop |
| EPA (Shaughnessy) Code: | 031501 (acid); 031503 (potassium salt); 031516 (diethanolamine salt); 031519 (dimethylamine salt), 031563 (isooctyl ester). |
| Chemical Abstracts Service (CAS) Number: | 7085-19-0 (acid)<br>1929-86-8 (potassium salt)<br>1432-14-0 (diethanolamine salt)<br>32351-70-5 (dimethylamine salt)<br>28473-03-2 (isooctyl ester) |
| Year of Initial Registration: | 1964 (potassium salt) |
| Pesticide Type(s): | Herbicide; postemergence |
| Chemical Family: | Chlorinated phenoxy |
| U.S. and Foreign Producers: | Aceto Chemical Co., Inc.; Akzo Zout Chemie Nederland; Dow Chemical USA; Gilmore, Inc.; A.H. Marks Co., Ltd.; Rhone-Poulenc Ag Co. |

## USE PATTERNS AND FORMULATIONS

| | |
|---|---|
| Registered Uses: | Terrestrial nonfood crop - Golf courses, lawns, ornamental and sports turf, wide area general indoor/outdoor treatments.<br>Aquatic nonfood crop - Drainage ditch banks.<br>Forest trees - site preparation. |
| Principle Uses: | Ninety-six percent of the production is used on turf, including lawns, sport turf and commercial sod production. A small percentage (1-4%) is used in noncrop areas such as rights-of-way, drainage ditch banks and forest site preparation. |
| Formulations: | Granular, wettable powder, emulsifiable concentrate, soluble concentrate/liquid, pressurized liquid. |

Methods of Application: Foliar applications by ground equipment including spreader, sprayer, pressure on hose-end sprayer and pressurized containers.
Application by air on specific noncropland sites.

SCIENCE FINDINGS

Summary Science Statement: Virtually all data reviewed were on MCPP acid. Data are needed for the ester and each salt, with the exception of the potassium salt, for which the data on the acid will suffice, before the Agency can completely assess the effects the forms of MCPP pesticides to organisms and the environment.

The Agency's Office of Pesticide Programs (OPP) has classified MCPP as a teratogen, based upon results of a study in rats. Margins of safety may not be adequate for some workers; additional data are required to refine estimates of worker exposure. A decision on the need for further regulatory action will be made when these data have been submitted and evaluated.

MCPP is stable to hydrolysis, had slow photodegradation in water, and was very mobile in sand, sandy loam, silt loam, and silty clay loam soils. The submission of data are required for terrestrial nonfood and aquatic nonfood uses for all type formulations.

Freshwater fish toxicity data on MCPP acid is incomplete, with a rainbow trout study that revealed very low acute toxicity of MCPP acid of 124 ppm. There were no acceptable acute freshwater aquatic invertebrate data submitted.

There were no acceptable data for toxicity of any MCPP formulations to nontarget plants, endangered species, or nontarget insects.

It is possible that chlorinated dibenzo-p-dioxins or dibenzofurans may be formed during the manufacture of MCPP. It is also possible that nitrosamines may be formed during the manufacture or storage of the MCPP amine salts. Thus, manufacturing process information is required to assess the possibility of the formation of these contaminants.

## Chemical Characteristics

| | |
|---|---|
| Physical state: | Crystalline solid |
| Color: | White to light brown |
| Odor: | Odorless |
| Molecular Weight: | 214.7 |
| Empirical Formula: | $C_{10}H_{11}ClO_3$ |
| Boiling Point: | Decomposes before reaching boiling point |
| Vapor Pressure: | 1.4 x 10-5 mm Hg at 20°C; 4.7 x $10^{-5}$ mm Hg at 30°C |
| Melting Point: | 94°-95°C |
| Density, bulk: | 0.6g/ml, dry uncompacted |
| Solubility: | 0.06% in water at 20°C; readily soluble in alcohol, benzene, acetone, chlorinated hydrocarbons |

## Toxicology Characteristics

| Acute Toxicity | | Toxicity Category* |
|---|---|---|
| Acute Oral: | 558 mg/kg | III |
| Acute Dermal: | Not lethal to rabbits at 2 g/kg | III |
| Acute Inhalation: | Data gap | |
| Primary Dermal Irritation: | No dermal irritation in rabbits exposed for 24 hours to abraded and unabraded skin | IV |
| Primary Eye Irritation: | Produces persistent corneal opacities, iritis, and conjunctival irritation in both washed and unwashed eyes. | I |
| Dermal Sensitization: | Data gap. | |

*For a description of Toxicity categories, see 40 CFR 156.10

Delayed Neurotoxicity: Data are not available. Testing is not required because MCPP and its derivatives and metabolites are not organophosphates or cholinesterase inhibitors.

Subchronic Toxicity: Oral exposure of rats to technical MCPP caused increased creatinine levels in females and decreased glucose levels in males at 27 mg/kg; increased relative kidney weights in both sexes at 9 mg/kg and 27 mg/kg, respectively. The NOEL was 3 mg/kg.

Chronic Studies

Chronic toxicity: No data are available and none are required because this pesticide does not have food uses.

Oncogenicity: There were no data available nor are any required.

Teratogenicity & Developmental Toxicity: In a rat study, oral exposure to 125 mg/kg of MCPP on days 6-15 of gestation caused increased intra-uterine deaths, decreased crown/rump lengths, and an increased incidence of delayed or absent ossification of the sternebrae. The NOEL was 50 mg/kg/day. MCPP was not teratogenic in rabbits. A reproductive toxicity study is not required.

Mutagenicity

Gene Mutations. In a spot test, no increases in reverse mutations in 4 strains of Salmonella were seen with or without metabolic activation and no forward mutations to streptomycin resistance were seen in S.Coelicolor A3(2) in spot or standard plates, with or without activation.

Other Tests. MCPP caused an increase in sister chromatid exchange after single oral doses of 470 and 3800 mg/kg in Chinese Hamsters. Additional data are required.

Major Route of Exposure: Dermal.

Physiological and Biochemical Characteristics

MCPP is absorbed through leaves and roots and is translocated. It stimulates nucleic acid and protein synthesis and affects the efficacy of enzymes, either stimulating or inhibiting cell division.

Environmental Characteristics

Absorption and Leaching: Unaged MCPP is very mobile in sand, sandy loam, silt loam, and silty clay loam soils. Absorption has been positively correlated with the organic matter of the soils.

Hydrolysis: Technical MCPP at 51-52 ppm did not hydrolyze during 31 days of incubation in sterile buffered solutions (pH 5, 7, and 9) at 25°C ± 2°C.

Bioaccumulation: Available data indicate a low potential of MCPP to bioaccumulate in fish.

Ground Water: Available data indicate that MCPP is mobile in many soils and may potentially leach to ground water.

Ecological Characteristics

Avian acute toxicity: MCPP acid has been shown to have an acute oral $LD_{50}$ of 700 mg/kg to the bobwhite quail and is considered to be of low toxicity.

Avian dietary toxicity: Studies on MCPP acid indicate $LC_{50}$ values of >5620 ppm and 5000 ppm for the mallard and the bobwhite quail, respectively. These values are considered practically nontoxic to avian species on subacute basis.

Freshwater fish acute toxicity: MCPP acid has very low toxicity to the rainbow trout ($LC_{50}$ = 124 ppm).

Freshwater invertebrates toxicity: There were no acceptable freshwater invertebrate studies submitted.

Fish early lifestage and aquatic invertebrate life cycle toxicity: There were no fish early lifestage nor aquatic invertebrate life cycle studies submitted.

Nontarget plant toxicity: There were no acceptable nontarget plant studies submitted.

Nontarget insects: There were no data on effects of MCPP to honeybees and nontarget insects submitted.

Pesticide Incidents

There were no reports of MCPP pesticide incidents.

SUMMARY OF REGULATORY POSITION

1. Special review: The Agency is deferring a decision on initiating a Special Review of MCPP based on teratogenicity until data needed to refine worker exposure estimates have been submitted and evaluated.

2. Restricted Use: The Agency will not restrict the use of MCPP products at this time.

3. Special Data Requirements: The Agency is requiring a submission of special studies to refine exposure estimates to workers. These data will be used to assess the teratogenic risk posed by MCPP to workers or other persons exposed to MCPP.

4. Basic Data Requirements: The Agency is requiring data specific to the amines and the ester formulations as well as the

acid. Acceptable data received on the MCPP acid will be generally acceptable for the potassium salt.

5. Groundwater concerns: MCPP has the potential to contaminate groundwater because it is mobile in many mineral soils. Studies to evaluate the potential of MCPP and its metabolites to contaminate groundwater are required. A groundwater statement is required (see labeling section below).

6. Reentry requirement: Reentry data are required because of the potential teratogenic risk and because some use patterns involve post-treatment tasks that could result in dermal exposures of workers to MCPP residues. Workers are not permitted to reenter treated areas until sprays have dried and dusts have settled (see labeling section below).

7. Protective clothing requirement: The Agency is requiring mixers/loaders and applicators to use protective clothing and equipment. See the protective clothing statement in the labeling section below.

8. Endangered species regulatory position: There has been no determination that MCPP acid or any MCPP formulation would affect endangered animal or plant species.

9. Dibenzo-p-dioxins/Dibenzofurans: The Agency is requiring submission of manufacturing process data on MCPP to assess the possibility of contamination by dibenzo-p-dioxins or dibenzofurans.

10. Nitrosamines: The Agency is requiring chemical analysis of products containing MCPP amine salts for possible nitrosamine contamination.

11. Data for Immediate Review: The Agency has identified data which will be reviewed as soon as they are received: product chemistry; environmental fate; dermal absorption, applicator exposure and reentry; toxicity on the amine salts and ester; and Tier II phytoxicity.

LABELING REQUIREMENTS

Statements for Manufacturing-Use Products

"Do not discharge effluent containing this product into lakes, streams, ponds, estuaries, oceans or public waters unless this product is specifically identified and addressed in an NPDES permit. Do not discharge effluent containing this product to sewer systems without previously notifying the sewage treatment plant authority. For guidance, contact your State Water Board or Regional Office of the EPA."

Statements for End-Use Products

Ground Water Contamination: "Although highly mobile, in general phenoxy herbicides such as MCPP are not sufficiently persistent to reach ground water from use as specified on product labels. Most cases of ground water contamination involving phenoxy herbicides have been associated with mixing/loading and disposal sites. Caution should be exercised when handling MCPP at such sites to prevent contamination of water supplies."

Protective Clothing: "Mixer/loader and applicators must wear long pants, long sleeve shirts, and gloves. Persons applying liquid MCPP products such as sprays are required to use goggles to cover their eyes."

Worker Reentry:
"Do not reenter or permit workers to reenter treated areas until sprays have dried or dusts have settled."

Nontarget Plant Species:

Aquatic uses:
"Drift or run-off may adversely affect nontarget plants. Do not apply directly to water except as specified on this label. Do not contaminate water when disposing of equipment washwaters."

Nonaquatic uses:
"Drift or run-off may adversely affect nontarget plants. Do not apply directly to water or wetlands (swamps, bogs, marshes and potholes). Do not contaminate water when disposing of equipment washwaters."

SUMMARY OF DATA GAPS

The following data are required as specified. Uses of MCPP potassium salt may be supported with data on either the salt or MCPP acid. Codes for the different formulations are MCPP Acid (1), Potassium Salt (2), Diethanolamine (3), Dimethylamine (4), and Isooctyl Ester (5).

| Study | MCPP Formulation | Due Date - From Date of Standard |
|---|---|---|
| Product Chemistry: | All | 9-12 months |
| Toxicology: | | |
| Acute Oral, Dermal, Inhalation, Eye | 3, 4, 5 | 9 months |

| | | |
|---|---|---|
| Irritation, Dermal Irritation and Sensitization | | |
| Subchronic | | |
| 21-Day Dermal | All | 12 months |
| Chronic | | |
| Teratogenicity | 3, 4, 5 | 15 months |
| Mutagenicity | 3, 4, 5 | 9 months |
| Chromosomal Aberration | All | 12 months |
| Other (sister chromatid exchange) | 3, 4, 5 | 12 months |
| Special Testing | | |
| Dermal Absorption | All | 9 months |
| Applicator Exposure | All | (protocols due in 6 months) |
| Reentry Protection: | | |
| Foliar Dissipation | All | 27 months |
| Soil Dissipation | All | 27 months |
| Dermal Exposure | All | 27 months |
| Environmental Fate: | | |
| Hydrolysis | All | 9 months |
| Photodegradation | | |
| Water and Soil | All | 9 months |
| Metabolism | | |
| Aerobic Soil | All | 27 months |
| Anaerobic Aquatic | 2, 4, 5 | 27 months |
| Aerobic Aquatic | 2, 4, 5 | 27 months |
| Mobility | | |
| Leaching and Adsorption/Desorption | All | 12 months |
| Dissipation | | |
| Soil | All | 27 months |
| Aquatic (sediment) | 2, 4, 5 | 27 months |
| Forestry | 4 | 27 months |
| Accumulation | | |
| Irrigated Crops | 2, 4, 5 | 39 months |
| Fish | All | 12 months |
| Aquatic Nontarget Organisms | 2, 4, 5 | 12 months |

Wildlife & Aquatic Organisms:

Avian & Mammalian:

| | | | |
|---|---|---|---|
| Acute Avian Oral | | 3, 4, 5 | 9 months |
| Avian Subacute | | | |
| Upland Game Bird | | 3, 4, 5 | 9 months |
| Waterfowl | | 3, 5 | 9 months |

Aquatic Organism:

| | | | |
|---|---|---|---|
| Freshwater Fish | | | |
| Coldwater Fish | TGAI | 3, 4, 5 | 9 months |
| Coldwater Fish | TEP | 1, 3, 4, 5 | 9 months |
| Warmwater Fish | TGAI | All | 9 months |
| Warmwater Fish | TGAI | 2, 4, 5 | 9 months |
| Freshwater | | | |
| Invertebrates | TGAI | All | 9 months |
| Invertebrates | TEP | 2, 4, 5 | 9 months |

Plant Protection:

Nontarget Phytotoxicity - Tier II:

| | | | |
|---|---|---|---|
| Seed Germination/Emergence | TGAI | All | 9 months |
| Vegetative Vigor | TGAI | All | 9 months |
| Aquatic Plant Growth | TGAI | All | 9 months |

Nontarget Insect:

| | | | |
|---|---|---|---|
| Honey Bee Contact | TGAI | 2, 3, 4, 5 | 9 months |

---

CONTACT PERSON AT EPA: Mr. Richard Mountfort
Product manager (Team 23)
Fungicide-Herbicide Branch
Registration Division (TS-767C)
Office of Pesticide Programs
Environmental Protection Agency
401 M St., SW
Washington, D.C. 20460

Physical Location: Crystal Mall #2
1921 Jefferson Davis Highway
Arlington, VA

Telephone number: (703) 557-1830

DISCLAIMER: The information in this Pesticide Fact Sheet is a summary only and may not be used to satisfy data requirements for pesticide registration and reregistration. The complete Registration Standard for the pesticide may be obtained from the National Technical Information Service. Contact the Product Manager listed above for further information.